

REMARKS

Claims 1-16 are pending. Claims 14 and 15 previously were withdrawn in response to a restriction requirement. None of the pending claims is currently amended.

Claims 1-13 and 16 are rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent Application Publication No. 2005/0112418 (Roberts). Applicant respectfully disagrees with these rejections for at least the following reasons.

Claim 1 recites a fuel cell stack having a stacked body with end plates and electrical heaters disposed near ends of the stacked body or the end plates. A control unit is operatively connected to the electrical heaters (and to a water purging device) and is adapted to operate the electrical heaters (and the water purging device) when a power generation stop command for stopping power generation in the fuel cell stack is output.

The foregoing claim features can be appreciated by referring to the exemplary fuel cell stack 1 in FIG. 1 of the present application. The illustrated stack has a stacked body 3 with end plates 4. Electrical heaters 5 are disposed near opposite ends of the stacked body 3. A control unit (ECU) 6 is operatively connected to the electrical heaters 5 (and to a water purging device 7/8) and is adapted to operate the electrical heaters 5 (and the water purging device 7/8) when a power generation stop command for stopping power generation in the fuel cell stack is output. In some embodiments, the claimed subject matter helps ensure that a fuel cell stack is shut down in such a manner that, when it subsequently is restarted, it can quickly start generating power in a highly efficient manner.

As discussed below, the Roberts publication does not disclose or render obvious the claimed subject matter.

The Roberts publication discloses a fuel cell electric power generation system that includes a fuel cell stack 210. *See* FIG. 3. A purge system 250 can purge the hydrogen and oxidant passages in the fuel cell stack 210 with a low humidity, non-reactive gas, such as nitrogen. *See* ¶ [0074]. A purge flow control device controls purging operations when the stack 210 is shut-down. *See* ¶ [0015]. More particularly, when a signal is received to shut down the

stack 210, the purge flow control device opens a switch connecting the stack to the external circuit, thereby interrupting the supply of current from the stack to an external circuit. *See* ¶ [0015]. Then, the control unit shuts off the reactant flow and opens the purge control valve for a selected period of time.

The Roberts publication also discloses a method of expediting the warming of a fuel cell stack to a desired operating temperature range when the fuel cell stack is started. *See* ¶ [0036]. The method includes allowing coolant to flow to the fuel cell stack only after the operating temperature of the stack has exceeded a predetermined temperature threshold. *See* ¶ [0038]. Once the desired operating temperature range is reached, conventional temperature regulation techniques are used to keep the fuel cell stack operating within the desired temperature range. *See* ¶ [0040].

The Office action itself concedes that the Roberts publication does not disclose electrical heaters disposed near ends of a fuel cell's stacked body or end plates of the stacked body. It is clear, therefore, that the Roberts publication also does not disclose a control unit that is operatively connected to such electrical heaters and adapted to operate the electrical heaters (and a water purging device) when a power generation stop command is output, as recited in claim 1. Nor, as discussed below, would the foregoing claim features or the claimed subject matter as a whole have been obvious in view of the Roberts publication.

The Office action alleges that the foregoing claim features would have been obvious because the Roberts publication states that heat treating after a cold start improves subsequent fuel cell performance and that, as an alternative to the above-referenced heat treating techniques, an externally powered heater or a hot fluid stream could be used to heat the stack. *See* ¶ [0048]. As discussed below, this disclosure would not have led a person of ordinary skill to the claimed subject matter.

First, Roberts explains that heat treating after a cold start improves subsequent fuel cell performance. This would not have led to the claimed subject matter because it has nothing at all to do with operating electrical heaters when a power generation stop command for stopping power generation in the fuel cell stack is output, as recited in claim 1. Indeed, the Roberts

publication does not mention or suggest any reason why it might be desirable to operate heaters (electrical or otherwise) when a power generation stop command for stopping power generation in the fuel cell stack is output, as recited in claim 1.

Additionally, the statement in Roberts that an externally powered heater or a hot fluid stream could be used to perform the heat treating – after a cold start - clearly would not have led a person of ordinary skill to produce a system in which electrical heaters are operated when a power generation stop command for stopping power generation in the fuel cell stack is output, as recited in claim 1. Indeed, there appears to be no logical connection between these statements in Roberts and the claimed subject matter.

Moreover, a person of ordinary skill would have had no reason, in view of Roberts, to dispose electrical heaters near the ends of a stacked body or end plates in a stack, as recited in claim 1. The Roberts publication merely states that an externally-powered heater could be used to heat a stack. It says nothing about the position of such heaters. It certainly provides no reason why a person of ordinary skill would have disposed the heaters, as recited in claim 1, near the ends of the stacked body or end plates.

Claim 1 should be allowable for at least the foregoing reasons.

Claims 2-13 and 16 depend from claim 1 and, therefore, should be allowable for at least the same reasons as claim 1.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper.

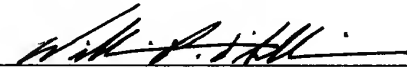
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No fee is believed to be due. Please apply any charges or credits to deposit
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Respectfully submitted,

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